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ABSTRACT

The objective of the study was to evaluate (1) the needs and resources available to local school districts in data processing; (2) the needs and resources available for regional data processing centers; and (3) the types of services, including programing packages, that would be offered by the regional data processing centers. The study analyzed data functions currently used or planned by the districts and processing needs relative to the size of the district. Data for the study were obtained from a survey of about 100 local school districts and from discussions with local district and State education personnel. Major conclusions are as follows: (1) districts with less than 1,500 students require no data processing services, (2) initially, the experimental regional data processing center should be under local control, and (3) county cnters should be selected as regional sites. A model is proposed for the establishment of regional data processing centers with recommended boundaries. In addition, recommendations are made concerning organization, staffing, and operation of the centers. Related documents are EA 002 689, EA 002 869, and EA 002 870. (Author)

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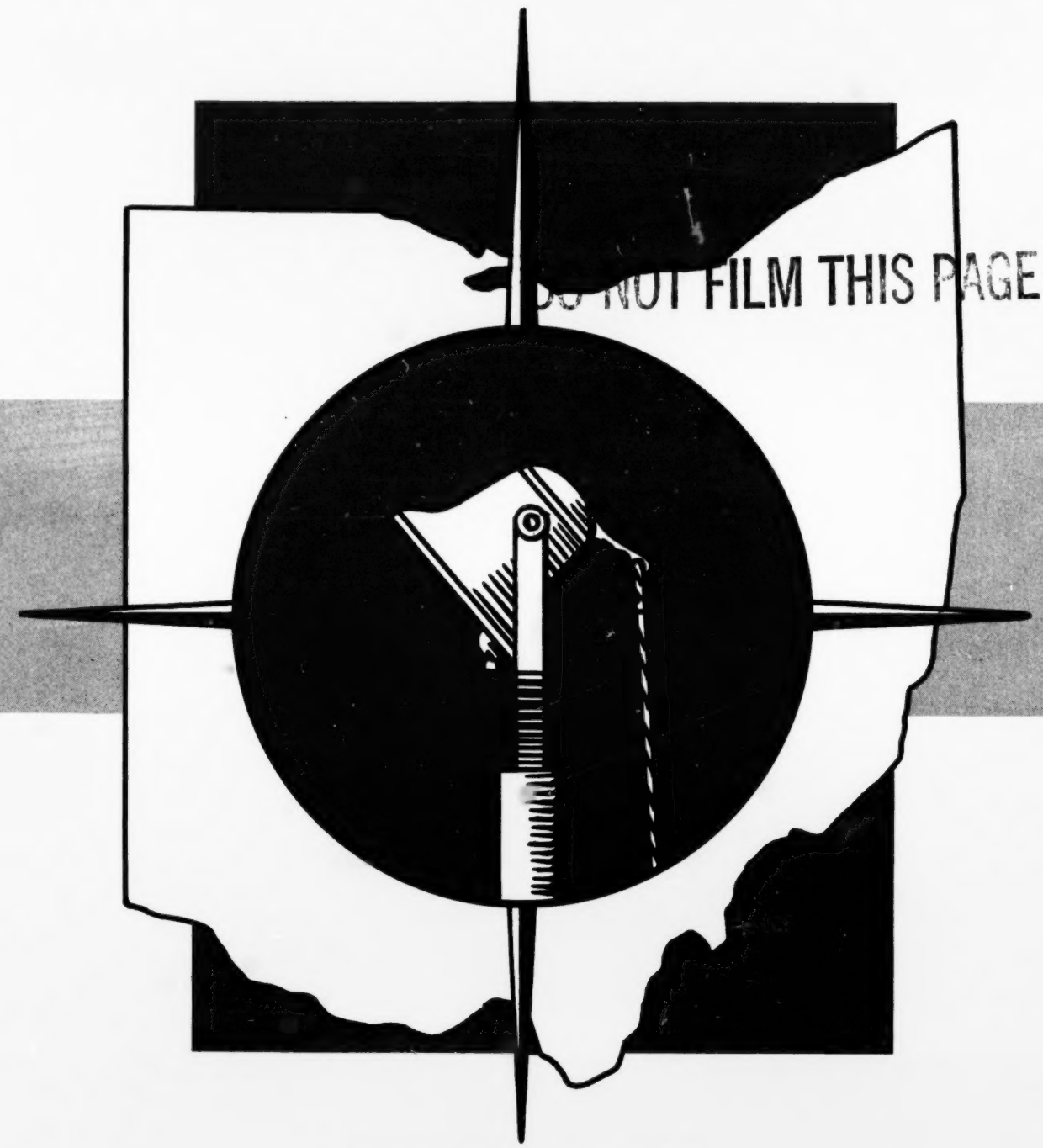

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PREPARED FOR THE

OHIO DEPARTMENT OF EDUCATION

BY

BATTELLE MEMORIAL INSTITUTE
COLUMBUS LABORATORIES

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CONDENSED TASK REPORT

on

REGIONAL DATA PROCESSING CENTERS IN OHIO

to

OHIO DEPARTMENT OF EDUCATION

November, 1968

by

W. Drozda

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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FOREWORD

This report is the result of editing and reducing one of a series of Task Reports prepared by the staff of Battelle Memorial Institute, Columbus Laboratories, for the Ohio Department of Education under a contract research project entitled **PLANNING TO MEET EDUCATIONAL NEEDS IN OHIO SCHOOLS.** Funds for the project were made available under a Title III, ESEA grant from the U.S. Office of Education to the Ohio Department of Education.

This condensed version of a Battelle Task Report was prepared to present the essentials of Battelle's findings as briefly as possible without loss of content or continuity in order to facilitate dissemination of the research findings to a wider audience.

Battelle has assessed educational needs in vocational education and technical training, school facilities, paraprofessionals and supportive assistants, data processing, educational technology, library services, and pupil transportation, each of these being the subject of a research Task.

Eight reports were prepared by Battelle as a result of these studies: seven Task Reports and one Summary Report. The Task Reports represent research studies aimed at the seven subjects mentioned above. The recommendations and conclusions stated in the Task Reports do not reflect full consideration of the educational system as a whole. The Summary Report considers the Task Reports collectively and seeks to relate the results of the Task studies to the educational system as a whole.

The reader is thereby offered two views, one of a specialized nature through a Task Report and one of an integrative nature through the Summary Report. The two views will have much in common, but will occasionally reflect differences arising out of the different context in which the studies were viewed. Accordingly, the reader may wish to study both the Summary Report and the related Task Report on a given subject.

This report is a Condensed Task Report. It carries the essential impact of the Task Report from which it was taken.

Dissemination of the material contained herein is the responsibility of the Ohio Department of Education. Requests for copies with designation of the report(s) desired, may be directed to Dr. Russell A. Working, Division of Research, Planning and Development, 71 East State Street, Room 205, Columbus, Ohio 43215.

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REGIONAL DATA PROCESSING CENTERS IN OHIO

INTRODUCTION

Objectives

The objective of the data processing task was to evaluate the needs and resources available to local school districts in the area of data processing. Because the establishment of regional data processing centers was of prime concern to the Ohio Department of Education, this task was further defined to include the following objectives:

(1) An evaluation of the needs and available resources for regional data processing centers

(2) An evaluation of the types of services including programming packages that should be offered by the regional data processing centers.

This discussion describes the approach and results of the research effort in data processing.

Scope

The need for regional data processing centers was evaluated on the basis of the potential use of data processing equipment by local districts for administration purposes. It was thought that a secondary need might include the collection and reduction of data from the local districts by the Ohio Department of Education for statistical analysis and report production. This effort is currently being done on a centralized basis. It was determined that regional computer centers were not required to perform this ODE function. This function could be effectively accomplished either as a centralized function or on a regional basis. Therefore, the collection and reduction of data by ODE do not materially affect the evaluation of the needs for regional data processing centers.

The scope of this analysis is as follows:

(1) The prime concern of this study includes the evaluation of general hardware and software needs and the organizational requirements for the administrative use of computers by local districts.

(2) The requirements for unit-record equipment, e.g., key punch equipment, sorters, verifiers, etc., were not evaluated as part of this analysis.

(3) The potential effects of long-range applications were not evaluated. Selection of hardware with extensive upward growth capabilities should permit expansion for potential applications in the future.

(4) Computer-assisted instruction (CAI) was not evaluated as part of this Task.

(5) The possible joint use of regional data processing centers for administrative purposes and vocational education training was not evaluated.

BACKGROUND OF THE PROBLEM

Description of Administrative Functions

There are a wide variety of administrative functions performed by local school districts that require some degree of data manipulation. Data processing could be widely applied to almost all of these functions. The direct benefits of using data processing equipment for any of these functions is directly related to the size of the school district.

Shown in Table 1 are the basic functions performed by practically all school districts. The functions can be logically grouped into four broad categories:

(1) Student

(2) Financial

(3) Personnel

(4) Facilities.

The most extensive application of data processing techniques to date have been in the Student Function Category. Specifically, the functions of scheduling, attendance, and grade reporting are the most common applications.

TABLE 1. BASIC ADMINISTRATIVE FUNCTIONS PERFORMED BY LOCAL SCHOOL DISTRICTS

Student Functions	Financial Functions	Personnel Functions	Facilities Functions
Psychological Services	General Accounting	Payroll	Equipment and Supplies
Enrollment Forecasts	Budgeting	Personnel Records	Short and Long Range Planning
Census Statistics	Financial Forecasts	Directories	Textbook and Library Book Control
Attendance Recording	Major Fund Accounting	SF-1 Reports	Transportation
Permanent Records	Federal Assisted Projects	Retirement Records	Inventory Records
Class Scheduling	Cost Accounting		Construction
Test Scoring and Analysis	Accounts Payable		Cafeteria Operations
Student Transcripts	Purchasing		
Grade Reporting			
Curriculum Planning			

The list of Table 1 is not intended to be a totally exhaustive list of school administrative functions. The list is of sufficient detail to indicate the many potential applications of data processing equipment. It should be noted that although the basic functions have been grouped by category, many of these functions are closely related. For example, census and enrollment forecasting is directly related to facilities planning activities. The extent of effort devoted to the above activities is directly related to the size of the local school districts.

Most Common School District Data Processing Applications

The most common applications of data processing equipment to local school district administrative problems are shown in Table 2 including a brief definition of each function. These applications were used as the primary means of evaluating data processing needs.

The applications shown in Table 2 represent practically all of the current data processing activities being performed by local school districts. The largest area of activity involves student accounting functions, particularly class scheduling and test scoring. With the exception of the major school districts, the use of data processing for Financial, Facilities, and Personnel functions is minimal.

Existing Data Processing Equipment

A reasonably complete list of data processing facilities was developed, based upon the knowledge of ODE personnel. It was not beneficial to undertake an exhaustive survey of existing data processing equipment operated by local school districts as part of this research program.

A wide variety of computer equipment is now in operation by the school districts. The capabilities of this equipment varies widely in memory sizes of the central processor and range of peripheral equipment. Peripheral equipment includes such hardware as tape drives, printers, disc drives, etc. Considerable computer equipment is on order from the various suppliers. The equipment on order for future delivery has not been identified.

ANALYSIS

The previous sections of this discussion have attempted to present a general background of the problem area. The general administrative functions of the school districts have been described and the primary areas of potential data processing applications have been defined. This section will undertake to describe the basic approach taken to the problem and the results of this analysis.

TABLE 2. MOST COMMON APPLICATIONS OF DATA PROCESSING EQUIPMENT TO SCHOOL FUNCTIONS

Student Functions:		
Attendance	–	Recording and maintaining attendance file for each student
Census	–	Maintenance of primary resident file to estimate future direct enrollment
Report Cards	–	Preparation of grade cards for distribution to parents
Permanent Records	–	Maintenance of permanent student records including grades, attendance, etc.
Registration	–	Registration information containing data on courses requested, etc.
Class Schedules	–	Preparation of class schedules observing such restrictions as maximum students per class, elimination of conflicts, etc.
Transcripts	–	Preparation of student records on request for transmittal to interested party
Test-Scoring	–	Automatic scoring of tests with a scanning device
Financial Functions:		
General Accounting	–	Dollar accounting of expenditures according to accounting system used by local District
Budgeting	–	Establishment of budgets by major account for each school year
Cost Analysis	–	Detailed analysis of costs associated with major operations
Purchasing	–	Maintenance of purchase order files, payments, deliveries, etc.
Personnel Functions:		
Payroll	–	Preparation of payroll reports, checks, W-2's, etc.
Retirement	–	Maintenance of individual retirement records for each school employee
SF-1 Reports	–	Annual report of all certified teachers
Personnel Records	–	Records on individual employees containing information on education, experience, etc.
Directories	–	Staff directories by school within each district
Facilities Functions:		
Cafeteria	–	Maintenance of income and expenditures of cafeteria operations
Inventory	–	Maintenance of withdrawals, additions, and order quantities for all supplies
Transportation	–	Maintenance of transportation cost records, scheduling maintenance on vehicles, etc.

Basic Assumptions

A number of assumptions were made which directly influence the results of this analysis. The assumptions made and a brief description are outlined below:

(1) The possible combined use of computers for administrative purposes and such areas as Computer assisted instruction (CAI) and vocational education was not to be evaluated as part of this Task.

(2) The concept of regional computer centers was to be structured around existing computer centers.

(3) Because of future growth and common language compatibility requirements, only third generation* computer hardware was considered as acceptable equipment for potential regional center sites.

Because of the extensive amount of computer equipment already available throughout the State, the necessity of using this equipment is apparent. The study could have been directed towards the design of an "idealized" system for the State ignoring existing equipment. The results of this analysis would probably not have been compatible with the hardware already available. The costs of replacing this hardware in favor of a different system would undoubtedly be prohibitive. Thus, it was assumed that the most cost-effective approach would involve structuring regional centers around existing equipment. Because a cost-effectiveness analysis was not made, it is necessary to include this aspect of the problem as an assumption.

Assumption (3) was made to assure that the proposed system would not become outdated at an early point. Any major system must allow for future expansion. (The possible growth of CAI is an excellent example.) Most third generation hardware has almost unlimited upwards compatibility. Thus, the system can be expanded without the necessity of major reprogramming efforts. In addition, common programming languages are required to assure maximum utilization of all program packages.

The above assumptions are considered to be valid and necessary to assure that a practical approach to regional computer centers be developed.

Research Procedures

The procedures used in the data processing analysis involved the following:

(1) Analysis of data processing applications

(2) Analysis of school district data processing needs as a function of the size of the district

(3) Discussions with local district and ODE personnel

(4) A survey of school district data processing plans.

*For example, IBM-360, Honeywell 200 Series, NCR Century Series.

The findings and a discussion of the above procedures are presented in the subsequent sections of this report.

Analysis of Data Processing Applications

The purpose of this phase of the analysis was to provide the necessary background on the types of applications currently being processed on computers by the school districts. These applications are listed and defined in Table 2. The area of student accounting is by far the most common application made of data processing equipment. Specifically, the problem of attendance, test scoring, and class scheduling reflect the most significant use of computers by local school districts. With the exception of the major school districts, very little application of data processing equipment was found in the financial, personnel, and facilities functions.

Data Processing Needs as a Function of the School District Size

To establish the requirements for data processing equipment, the size of the local school districts must be considered. School district size also directly affects data processing regional boundaries from the standpoint of balancing the computer load on each regional computer. A conventional approach to this problem is to establish data processing regional boundaries on the basis of the total student enrollment in the region. For example, it might be determined that a regional computer center should be established to serve up to 200,000 students. There is, however, a minimum size school district below which data processing is of no significant value to the school district. If a district is of such a small size, data processing techniques do not improve the efficiency or lower the administrative costs of the school district. An attempt was made in this analysis to determine the school district size constraint below which no significant data processing applications were required.

The class scheduling application is the most widely used computer program with regards to the size of the school district. An analysis was made of this application to determine an approximate minimum size school district for which this application would provide a cost saving or efficiency improvement. This analysis included discussions with school district data processing personnel. In most cases, the class scheduling program is used only for high schools because of the variety of courses in the high school curriculum. It was determined that a given high school should have at least 500 students before the class scheduling program would be of significant value. In other words, no significant scheduling problem exists if the high school has less than a 500 student enrollment. For small school districts, a high school of 500 students would represent roughly 1/3 of the total enrollment of the school district. Therefore, the school district should have a minimum enrollment of 1500 students before this application would be recommended. On this basis, it was determined that school districts having less than a 1500 student enrollment required no data processing. This fact is considered in determining data processing regional boundaries discussed later. The survey results discussed in a later section substantiate the minimum 1500 student enrollment.

Discussions with Local District and State Personnel

A study of this nature requires extensive discussions with school district and state personnel. These discussions served as a background to the evaluation of school district data processing needs. In addition, valuable insight regarding the possible organization of data processing regional centers was obtained. Many of the recommendations contained in this report were a direct result of these detailed discussions concerning data processing problems.

Survey Results

A survey form of data processing activities and plans was mailed to 111 local school districts. A total of 94 usable responses was received. The responses were grouped by the size of the school district as indicated by the Average Daily Membership (ADM). A tabulation of the 94 responses showing the number now using or planning to use data processing equipment versus those with no plans to use data processing equipment reveals an interesting picture. The single school district with less than 1000 ADM that plans to use data processing equipment plans to do class scheduling only. Of the 46 responses from districts having less than 2000 ADM, 32 or 70 percent do not plan to use data processing equipment. These results are in accordance with the previous analysis of data processing needs as a function of the size of the school district. Consequently, the conclusion was reached that regional data processing centers would not provide a useful service to the very small districts. The planning and development of the regional data processing centers should take this into account in establishing regional boundaries.

A tabulation of the applications now performed or planned by the school districts as a function of the size of the school district was made. Only the 50 responses indicating use or planned use of data processing equipment were used in this tabulation. This tabulation shows that class scheduling is the primary application of data processing equipment. Of the 50 responses, 49 (98 percent) are doing or plan to do class scheduling on computers. The study results indicate that student accounting activities represent the predominant applications. Significant applications in financial, personnel, and facility activities are found only a school districts with 7000 or more students in ADM.

The survey results also show that a basic beginning of regional data processing centers has already been established. A number of local school districts are already using other school district equipment or county equipment. A significant number of school districts that are presently not using data processing but plan to use computers do not know which equipment they will use. These districts could no doubt use the assistance of consultants from a state organization.

Research Results

Following are a few of the major conclusions that can be drawn from this analysis and the survey:

(1) Districts with less than 1500 students (ADM) require no data processing services.

Planning for regional centers should, therefore, exclude these districts.

(2) Initially, the experimental regional data processing center should be under local control. As the centers become formalized and new centers are instituted, management responsibility should then become an ODE function.

Initially, local control represents the most expedient way of initiating the regional data processing center concept. As the number of operational centers increases, it would be unrealistic to assume that effective management can be obtained with each region under separate local control. Therefore, it is recommended that all regional operations eventually be managed by a single organization within ODE.

(3) Where possible, county centers should be selected as regional sites.

Through discussions with local district and state personnel, it was learned that the major cities have enough problems at the present time. Therefore, they should not be responsible for the additional work load of regional centers. As the regional centers become established, it would be most desirable to merge the city and regional center operations.

The above are the major conclusions that the analysis revealed. In a subsequent section of this report, these conclusions are expanded and developed.

A MODEL SYSTEM

This section of the report expands the major conclusions and develops a proposed initial plan for the establishment of regional data processing centers. In addition, recommendations are made concerning organization, staffing, and operations.

Location of Centers and Regional Boundaries

Regional data processing boundaries are directly influenced by the following factors:

(1) Total enrollment (ADM) to be serviced by data processing equipment in the region

(2) Location of existing data processing facilities

(3) Geographic size of the region.

As discussed earlier, it was ascertained that school districts with less than 1500 ADM have no data processing needs. Therefore, the data processing regional boundaries reflect only those districts with an ADM greater than 1500 students. The actual number of students to be serviced by the regional center was found by eliminating those districts with no data processing needs.

Shown in Figure 1 are the recommended initial data processing regional boundaries and the location of the computer centers. The computer centers in Regions I, II, III, IV, V, VI, VIII, IX, and XI are in existence. The centers in Regions VII, X, and XII are recommended as future centers.

The supporting data for the data processing regional boundaries are shown in Table 3. The first two columns of Table 3 represent the total number of school districts and the total ADM within each county. The last two columns represent those school districts within each county with an ADM greater than 1500 students. The last two columns represent a more realistic computer load than the total ADM. In addition to eliminating districts with less than 1500 ADM, the major cities of Toledo, Cleveland, Akron, Dayton, Columbus, and Cincinnati are also excluded. These cities operate their own computer centers and it was felt that they should not be included in the initial regional centers. This additional work load would be too great of a burden on top of their present operations.

The total ADM to be serviced by each data processing regional center varies from a low of 58,600 students in Region XII to a high of 217,700 in Region II. Considering population density and geographic area, this variance is unavoidable. For example, Region X and XII might be combined into a single region of 135.7 ADM but the geographic size of this Region would be too large to service the school districts adequately. The size of the Region will, of course, require different computer configurations. That is, Region II would have a significantly larger installation than Region XII.

Of the 12 recommended data processing regions, 9 have computer equipment. The location and configuration of this equipment is shown in Table 4. The IBM-1401 equipment should be upgraded to either IBM-360 or Honeywell 200 equipment. This upgrading is required because the IBM-1401 cannot handle the required regional data processing load and this equipment does not have adequate capability for common languages such as COBOL and FORTRAN. In addition, the Honeywell 110 and 120 equipment should also be upgraded because the data processing load will exceed the capacity of this equipment.

It should be emphasized that the regional boundaries have been established on the basis of the present districts requiring potential data processing services. A number of factors can influence the regional boundaries and the equipment configuration requirements. It is presumed that the local districts will use the regional centers on a voluntary basis. If a significant number of districts elect not to use the regional centers, the equipment configuration required and perhaps the regional boundaries would have to be adjusted accordingly. On the other hand, if small districts tend towards consolidation or a major city center elects to join the regional center, then the equipment would have to be upgraded significantly or regional sizes reduced. For this reason, it is not possible to specify the required equipment configuration for each region until more information is obtained concerning the number of school districts that plan to participate in the regional data processing center.

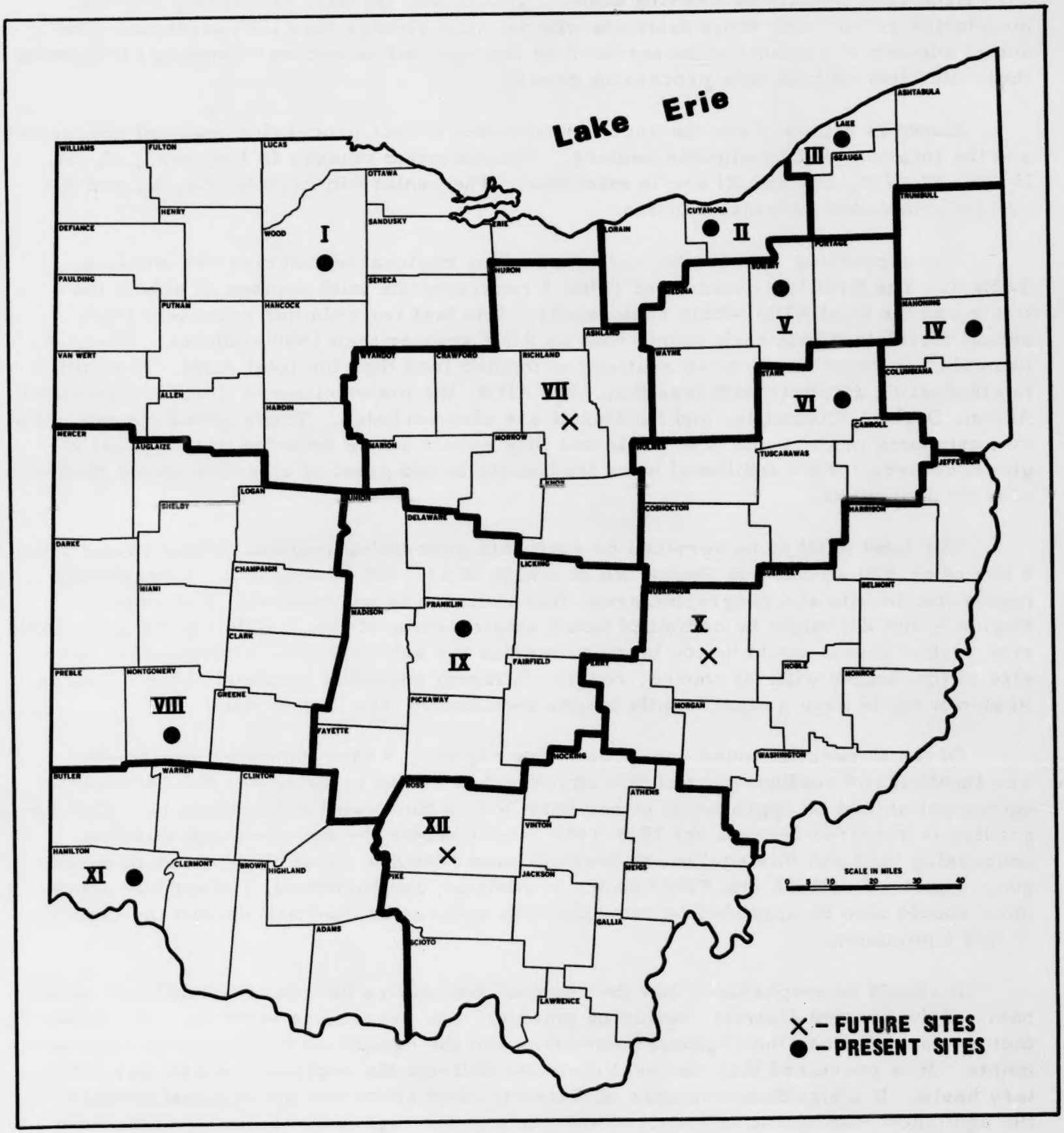

FIGURE 1. RECOMMENDED DATA PROCESSING REGIONAL BOUNDARIES

(Based on Fully Operational Regional Centers – Time Frame – 1972)

TABLE 3. COMPOSITION OF RECOMMENDED DATA PROCESSING REGIONS FOR 1972

County	Total		Districts With Data Processing Need (>1500 ADM)	
	School Districts	ADM (000's)	School Districts	ADM (000's)
Allen	11	24.5	4	17.8
Defiance	5	8.4	2	5.2
Erie	7	17.7	6	17.7
Fulton	8	9.5	4	6.8
Hancock	8	13.1	1	8.3
Harding	6	7.6	1	2.6
Henry	5	6.4	2	4.2
Lucas	8	89.3	6(a)	32.5(a)
Ottawa	7	8.2	3	7.4
Paulding	7	5.0	1	1.7
Putnam	9	8.0	1	1.5
Sandusky	7	13.7	4	11.3
Seneca	9	12.0	2	7.1
VanWert	4	5.3	1	2.9
Williams	7	7.8	1	2.4
Wood	10	17.0	7	15.0
TOTAL - Region I	118	253.5	46	144.4
Cuyahoga	32	306.1	27(b)	163.6(b)
Lorain	15	56.4	13	54.1
TOTAL - Region II	47	362.5	40	217.7
Ashtabula	7	22.1	5	19.1
Geauga	7	14.3	5	12.5
Lake	9	43.7	7	41.6
TOTAL - Region III	25	80.1	17	73.2
Columbiana	11	24.1	7	19.0
Mahoning	15	59.5	10	55.4
Trumbull	23	51.3	13	44.6
TOTAL - Region IV	49	134.9	30	119.0
Medina	7	21.0	6	19.9
Portage	11	26.9	9	24.1
Summit	17	117.0	15(c)	62.1(c)
Wayne	10	19.6	7	15.8
TOTAL - Region V	45	184.5	37	121.9
Carroll	2	3.7	1	2.9
Coshocton	3	7.4	3	7.4
Holmes	4	4.7	1	2.9
Stark	17	79.4	17	79.4
Tuscarawas	8	18.0	6	15.8
TOTAL - Region VI	34	113.2	28	108.4

TABLE 3. (Continued)

County	Total School Districts	Total ADM (000's)	Districts With Data Processing Need (>1500 ADM) School Districts	Districts With Data Processing Need (>1500 ADM) ADM (000's)
Ashland	4	9.1	2	6.7
Crawford	6	11.8	4	9.5
Huron	7	12.9	3	8.4
Knox	5	8.7	1	5.0
Marion	5	14.8	3	12.4
Morrow	4	5.2	1	1.5
Richland	9	30.5	6	26.8
Wyandot	4	5.1	2	3.9
TOTAL - Region VII	44	98.1	22	74.2
Auglaize	8	9.0	2	5.6
Champaign	5	8.1	2	5.1
Clark	7	35.0	6	34.0
Darke	10	11.0	2	5.4
Greene	7	31.0	5	29.1
Logan	6	7.8	2	4.6
Mercer	7	10.2	2	4.9
Miami	11	19.6	5	15.1
Montgomery	16	128.2	15(d)	73.1(d)
Preble	5	9.3	4	9.2
Shelby	8	9.2	1	4.4
TOTAL - Region VIII	90	278.4	46	190.5
Delaware	4	9.1	4	9.1
Fairfield	8	16.2	2	9.4
Fayette	2	6.2	2	6.2
Franklin	17	168.2	14(e)	68.1(e)
Licking	10	24.8	6	19.5
Madison	5	6.9	2	3.4
Pickaway	4	8.3	2	5.5
Union	3	5.0	2	3.9
TOTAL - Region IX	53	244.7	34	125.1
Belmont	10	15.8	5	11.6
Guernsey	5	7.1	2	5.8
Harrison	3	4.4	1	2.6
Jefferson	5	20.7	5	20.7
Monroe	2	3.8	1	2.9
Morgan	1	2.8	1	2.8
Muskingum	9	18.7	6	17.4
Noble	3	2.8	0	0
Perry	4	6.3	2	3.7
Washington	8	13.4	3	9.6
TOTAL - Region X	50	95.8	26	77.1

TABLE 3. (Continued)

County	Total School Districts	Total ADM (000's)	Districts With Data Processing Need (>1500 ADM) School Districts	Districts With Data Processing Need (>1500 ADM) ADM (000's)
Adams	6	4.8	0	0
Brown	6	5.8	0	0
Butler	10	49.6	8	47.7
Clermont	9	24.5	6	21.0
Clinton	4	8.8	3	7.3
Hamilton	24	165.5	20(f)	82.3(f)
Highland	5	7.3	2	4.7
Warren	8	22.4	8	22.4
TOTAL - Region XI	72	288.7	47	185.4
Athens	4	9.6	3	7.0
Gallia	5	5.9	1	2.9
Hocking	4	4.9	1	3.1
Jackson	4	7.1	3	6.9
Lawrence	7	14.1	6	13.0
Meigs	3	4.9	1	2.9
Pike	4	5.5	1	2.3
Ross	7	13.5	1	6.1
Scioto	11	18.5	4	11.9
Vinton	1	2.5	1	2.5
TOTAL - REGION XII	50	86.5	22	58.6
GRAND TOTAL	677	2220.9	395	1495.5

(a) Excludes Toledo.
(b) Excludes Cleveland.
(c) Excludes Akron.
(d) Excludes Dayton.
(e) Excludes Columbus.
(f) Excludes Cincinnati.

TABLE 4. LOCATION AND CONFIGURATION OF COMPUTER EQUIPMENT RECOMMENDED AS REGIONAL CENTERS FOR 1972

Region	Location	Equipment			
		Make	Type	Size	Peripheral
I	Wood County (Penta JVSD)	IBM	360/30	16K	2 Discs
II	Cuyahoga County	Honeywell	110	8K	3 Mag. Tapes
III	Lake County (Mentor City)	Honeywell	110	16K	4 Mag. Tapes
IV	Mahoning County (Youngstown City)	Honeywell	200	8K	4 Mag. Tapes
V	Summit County (Cuyahoga Falls)	Honeywell	110	8K	3 Mag. Tapes
VI	Stark County	IBM	1401	8K	--
VIII	Montgomery County	IBM	1401	12K	1 Mag. Tape 2 Discs
IX	Franklin County	Honeywell	200	28K	5 Mag. Tapes 1 Disc
XI	Hamilton County	IBM	360/40	65K	4 Mag. Tapes 3 Discs

The Regional Centers recommended in Figure 1 will probably require approximately 3 years to implement. This time frame is realistic considering the time requirements to develop operating procedures in the experimental centers, development of programming systems, and acquisition of new equipment. Thus, the Regional Center Operations would not be fully operational until 1972. During the interim phase regional boundaries will have to remain flexible. To service those districts desiring data processing services during the interim phase, rigid regional boundaries will not be desirable initially. It is expected that these services during this interim period will be provided by local arrangements as they currently are operating, except for some assistance at the State level as discussed later.

The regional computer centers as proposed above are independently operated centers. That is, no communication links are proposed within a region or among regions. During this study, no cost-justifiable need for remote terminals was found. It was concluded that the computer centers could provide adequate service to the local districts through conventional means of transmission. Input and output can be transmitted via such media as busses, U. S. mail, and/or delivery services. The possibility of using regularly scheduled pick-up and delivery services within a region should be investigated further. Should terminals be required in the future (perhaps due to a growth in CAI usage), the equipment recommended in the regions can easily be upgraded to handle these terminals. Because of this ability to upgrade, there is no need to incur the added expense of remote terminals and communication links at the present time.

The efficient utilization of data processing equipment at the regional centers implies that a two-shift operation be planned. Two-shift operation permits lower cost computer configurations to handle the loads at the centers. The third shift can be used for peak load periods. The computer hardware finally selected for each center should be planned on the basis of two-shift operations.

Because the standard programs will be developed centrally, it is necessary to write the programs in a single language. All modern computer equipment is capable of accepting FORTRAN and COBOL languages. Therefore, COBOL should be used for all business-type programs and FORTRAN should be used for all scientific-type problems. It is recommended that programs be written exclusively in these two languages.

Personnel Requirements

The primary support supplied by the State Department of Education for data processing regional center development will be personnel. Joint development of computer programs by State personnel in conjunction with the local school districts should directly result in significant cost savings in school administration expenses. To realize these savings, it is vital that the State organize a central group charged with the responsibility of developing programs that can be applied by many school districts. Not only should this be the primary State role, but the development of this staff should be an early step in establishing regional data processing centers.

A recommended organization chart for a State Information Services group is shown in Figure 2. A central staff of 24 professional personnel will be required. This staff is in addition to the present staff of the Division of Computer Services and Statistical reports. In addition, a regional staff of 18 personnel is also recommended. The

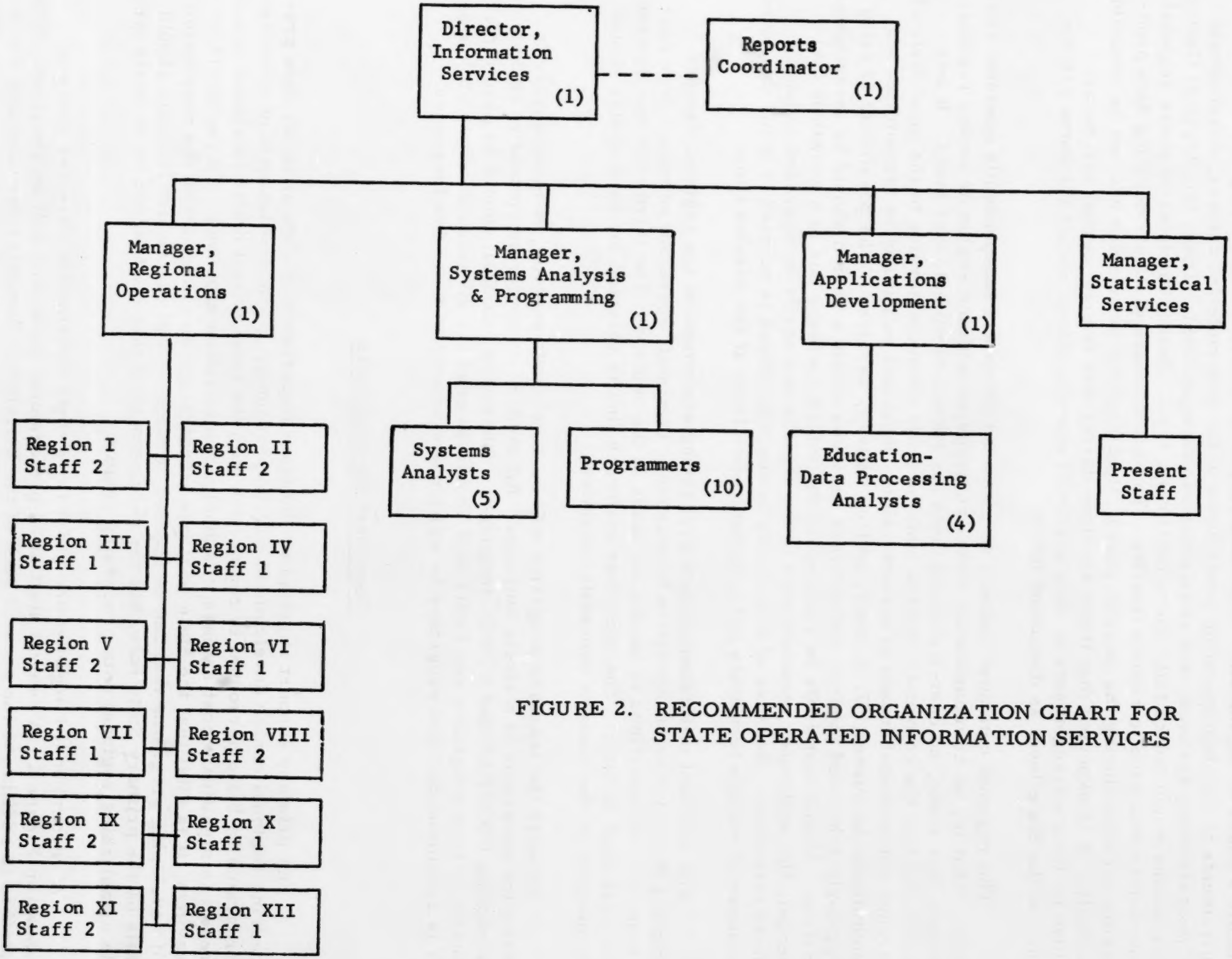

FIGURE 2. RECOMMENDED ORGANIZATION CHART FOR STATE OPERATED INFORMATION SERVICES

staffing requirements shown in Figure 2 does not include support personnel such as key punch operators, secretarial, computer operators, etc. Staff requirements would vary according to the level of participation among local school districts. No recommendation regarding the placement of this organization within the ODE organizational structure has been made. It is felt that the ODE management should make this decision. However, the present Division of Computer Services and Statistical Reports should be a part of the Information Service Group because of the comptability of operations and the close association required.

Regional Operations

It is recommended that State personnel be assigned to each region to assure that each school district receives adequate services. In a sense, the regional staff would be equivalent to an account executive. Each of the regional staff members would be assigned from 10 to 15 local school districts. Thus, the size of the regional staff is dependent upon the number of school districts being serviced, not the total student enrollment.

Implementation Plan

Because the primary service to be offered by ODE will be program development, the initial activity should be the organization and staffing of the Systems Analysis and Programming group. It is important that 2 to 4 people be hired in this area initially. Their initial task could be the development of a standardized accounting system and the establishment of program priorities. Outside assistance can be used to develop program packages.

Financial Consideration

The Data Processing Task did not include a detailed evaluation of financing methods. However, a few comments on this subject can be made.

The costs of operating regional data processing centers can be totally absorbed by the State or it can be totally absorbed by the local districts. Any combination of these two extremes is also possible. It does not appear to be practical for the State to absorb all of the costs of the operation because this could cause an inefficient use of the computers. If the service is free to the local districts, it is likely that their demands for services would include many impractical requests for data processing services. In addition, very small districts would use the service with no appreciable benefits.

It would appear then, that some fee should be charged to participating local districts for the computer services. This fee would depend upon the extent of State funding and the number of local districts participating in the center operation. Because all districts will not use all of the services offered by the center, the fee should be established on a program package basis. That is, a separate fee would be charged for pupil accounting, SF-1 reporting, etc. The fees would probably be based upon the number of pupils in the districts.

Initial funds for the development of regional data processing centers must be provided by the State of Ohio. Some or all of this initial investment could be recovered by including these costs as part of the fees charged to the districts when the regions become operational in 1972. The fee structure is a delicate problem. Fees are directly related to the participation of the local districts. In a given region, if participation is maximized, the fees would be minimized. However, to encourage participation by the local districts, it is important that the fee structure be financially attractive to the school districts when each center is initiated. The State should, therefore, establish attractive initial fees and plan to recover its cost over a long time as more districts join the Regional operations. After the State has recovered its initial investment and maximum participation by local school districts is obtained, the fees could be reduced or the State might apply additional services with no increase in costs to the districts.

A detailed cost and financial analysis should be undertaken early in the program before a survey of the school districts is made. The survey of local district interest could then include an estimate of the probable costs to the districts of the program.

CONCLUSIONS AND RECOMMENDATIONS

Summarized below are the fundamental conclusions and recommendations developed as a result of this research program.

(1) Regional data processing centers should be established because of the potential cost savings through the joint use of hardware and software.

(2) Twelve regional data processing centers will ultimately be required. Only three centers now have adequate equipment; consequently, it is recommended that an initial center be selected from one of these three, i.e., Youngstown, Franklin County, and Hamilton County. Equipment procurement for the other centers should be deferred until the initial test center is operating efficiently.

(3) A central staff of approximately 24 people and a regional staff of 18 people will be required. The immediate acquisition of staff should be in the area of Systems and Programming.

(4) School districts with less than 1500 students in ADM have no significant data processing needs. Therefore, these districts should not materially affect regional planning operations.

(5) All operations in the regional centers should be based on a two-shift operation with third-shift use for peak loads.

(6) The regional data processing centers should initially be established under the local control of the region. When regional operations have been formalized, management of regional data processing centers should become an ODE function.

(7) The position of Reports Coordinator should be established. All report requests, both within and without ODE, should be coordinated through the Reports Coordinator. The purpose of this position is to eliminate duplication and assure efficient forms design.

(8) A study to determine methods of financing should be undertaken as soon as possible.

(9) A survey of local districts should be made to determine their willingness to join a regional operation.

(10) No apparent need was established for remote terminals and communication links in the administrative area. Because of potential requirements, only third generation hardware should be considered.

(11) COBOL should be adopted as the basic business-programming language and FORTRAN as the basic scientific language.

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